

REMARKS

Claims 1-21 remain pending in this application. Claims 1, 11, 12, 20 and 21 have been amended. No new matter has been introduced by way of the present amendment. Reconsideration of the application is respectfully requested.

In the Office Action, claim 11 stands objected to because of informalities. By this amendment, claim 11 has been amended as to matters of form. Accordingly, Applicants respectfully submit that the Examiner's objections of claim 11 be withdrawn.

The Examiner further objected to claims 3 and 14 under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement. Applicants respectfully traverse the Examiner's objections. Claim 3 includes the feature "the comparator is further adapted to deliver the second signal in response to the parameter of the first signal falling below the parameter of the reference signal, and to discontinue delivery of the second signal in response to the parameter of the first signal rising above the parameter of the reference signal." Likewise, claim 14 includes a similar feature. The Examiner asserts that the Applicants' Specification discloses the comparator delivering the second signal when the first signal is greater than the reference signal, and discontinuing delivery when the first signal falls below the reference signal at page 11, line 24 through page 12, line 20, but the Specification does not disclose delivering the second signal when the first signal is below the reference signal, and discontinuing delivery when the first signal rises above the reference signal. The Examiner alleges that the Applicants' Specification does not expressly disclose the above-indicated features in claims 3 and 14. Applicants respectfully disagree with the Examiner's position in view of the arguments set forth below.

Applicants respectfully submit that claims 3 and 14 are supported by the Applicants' Specification. That is, it discloses the above-indicated features included in claims 3 and 14, for example, at page 12, lines 11-13, line 17, and lines 19-20. In particular, on page 12, lines 11-13, the Applicants' Specification describes that as the temperature of the memory array 210 rises above a second setpoint temperature T2, the temperature dependent voltage V_{temp} will be less than the second reference voltage V2, but remains above the third reference voltage V3. However, as the temperature of the memory array 210 rises above a third setpoint temperature T3, the temperature dependent voltage V_{temp} will be lower than the third reference voltage V3. Thus, the output terminals of the comparators 410, 411, 412 are all unasserted, indicating that the temperature of the memory array 210 is greater than T3. Therefore, it appears that the Examiner inadvertently misinterprets the disclosure of the Applicants' Specification at page 12, lines 11-13, line 17, and lines 19-20.

The Examiner rejected claims 1, 2, 12, 13, and 20 under 35 U.S.C. 102(b) as allegedly being anticipated by the U.S. Patent No. 4,505,150 to Seymour et al. (*Seymour*). Applicants respectfully traverse this rejection.

An anticipating reference by definition must disclose every limitation of the rejected claim in the same relationship to one another as set forth in the claim. M. P. E. P. § 2131. In the Office Action, on page 4, the Examiner fails to appreciate a fundamental distinction in that a semiconductor temperature sensor ensures desired operation of a semiconductor device, such as a memory unit over a preselected temperature range.

Seymour fails to teach or suggest such a temperature sensor for controlling operation of a semiconductor memory unit over a preselected temperature range for a preselected duration of time, as set forth in claim 1. That is, *Seymour* is completely silent regarding this feature now set

forth in independent claims 1, 12, and 20. In other words, *Seymour* does not describe a temperature sensor in thermal communication with at least a portion of a semiconductor memory unit, let alone to control refreshing in the semiconductor memory unit over the preselected temperature range. Thus, *Seymour* fails to disclose or suggest all the features of claim 1. However, the Examiner asserts that *Seymour* teaches the claimed invention in Figure 1 and the associated description. Applicants respectfully disagree. Instead, *Seymour* teaches a circuit that senses a surge in a gas turbine engine, from a pyrometer output signal representative of the temperature of a turbine of the gas turbine engine. See *Seymour*, at column 1, lines 34-37. Based on the above indicated legal standard, it is respectfully submitted that *Seymour* fails to anticipate independent claim 1. Thus, claim 1 and claims dependent therefrom are in condition for allowance which is respectfully requested of the Examiner.

The Examiner alleges that *Seymour* in Figure 1 discloses the temperature sensor set forth in claim 1. More specifically, the Examiner asserts that a device (2) adapted to provide a first signal having a parameter responsive to temperature is described at column 1, lines 58-60 and a generator adapted to provide a reference signal (V_{REF}) having a parameter that is substantially consistent over a preselected temperature range is disclosed in column 1, line 68 through column 2, line 2. A comparator (10) electrically coupled to the device (2) and the generator adapted to provide a second signal in response to the parameter of the first signal differing from the parameter of the reference signal is purportedly described at column 2, lines 22-37 and 46-49. The Examiner also asserts that a digital filter (12,14,16,18) coupled to the comparator (10) and adapted to provide a third signal in response to receiving the second signal for a preselected duration of time (4 ms) is described at column 2, lines 49-67.

As amended, however, independent claim 1 includes a temperature sensor that is in thermal communication with at least a portion of a semiconductor memory unit and controls refreshing in the semiconductor memory unit over a preselected temperature range. In this way, claim 1 sets forth, among other things, thermally coupling the temperature sensor with a semiconductor device to control a memory operation during both normal and extreme temperature ranges.

Seymour is directed towards sensing of surges in gas turbine engines. In a gas turbine engine when a surge (a breakdown of airflow through the engine compressor) occurs, too little air enters the engine combustors sufficiently to weaken the burning fuel mixture and unless the fuel supply is reduced an explosion may occur. *Seymour* describes a pyrometer that senses blade temperature in the engine and detects the onset of such an engine surge. In particular, a pyrometer 2 produces an electrical output signal representative of the temperature of the high-pressure turbine of a gas turbine engine. See *Seymour*, at column 1, lines 58-61. A circuit senses a surge in a gas turbine engine, from a pyrometer output signal representative of the temperature of a turbine of the gas turbine engine. See *Seymour*, at column 1, lines 34-37. In this way, *Seymour* distinguishes between spikes in a pyrometer output signal due to hot, uncombusted particles and increases in the output signal indicative of a surge.

However, in claim 1 the temperature sensor in thermal communication with a semiconductor memory device controls its refreshing. In other words, claim 1 states that at least a portion of a temperature sensor is located, for example, within or adjacent the semiconductor memory device such that it provides an adequate indication of temperature of the memory device, such as a memory array to reactively adjust or modify refreshing. That is, instead of implementing a worst-case refresh cycle that ensures proper operation of the memory device 110

at extreme temperatures, a reactive adjustment of the frequency of the refresh cycle may be implemented. Indeed, the Applicants' Specification describes that, during normal temperature ranges, a more efficient refresh cycle may be implemented, and during extreme conditions, such as high temperature ranges, appropriate refresh cycles may be implemented, thereby promoting many advantages, such as power savings. See Applicants' Specification, on page 8, line 23 to page 9, line 4. Accordingly, Applicants respectfully submit that *Seymour* does not disclose, teach, or suggest all of the elements of independent claims 1, 12, and 20, as amended. Thus, Applicants respectfully assert that independent claims 1, 12, and 20 and respective dependent claims are in condition for allowance, which is respectfully requested of the Examiner.

In the Office Action, dependent claims 3 and 14 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over *Seymour* in view of the U.S. Patent No. 4,811,288 to Kleijne et al. (*Kleijne*). Applicants respectfully traverse the Office's §103 rejection of dependent claims 3 and 14. Claim 3 is directed to a temperature sensor that, among other things, includes a comparator adapted to deliver a second signal in response to a parameter of a first signal falling below a parameter of a reference signal, and to discontinue delivery of the second signal in response to the parameter of the first signal rising above the parameter of the reference signal by a preselected magnitude.

As the Examiner well knows, to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the

reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure.

With respect to alleged obviousness, there must be something in the prior art as a whole to suggest the desirability, and thus the obviousness, of making the combination. In face, the absence of a suggestion to combine is dispositive in an obviousness determination. The mere fact that the prior art can be combined or modified does not make the resultant combination obvious unless the prior art also suggests the desirability of the combination. See M.P.E.P. §2143.01. The consistent criterion for determining obviousness is whether the prior art would have suggested to one of ordinary skill in the art that the process should be carried out and would have a reasonable likelihood of success, viewed in the light of the prior art. Both the suggestion and the expectation of success must be founded in the prior art, not in the Applicant's disclosure.

Applicants submit that claim 3 is not obvious in view of *Seymour* and *Kleijne*, either considered alone or in combination. As discussed below, the Examiner concedes that *Seymour* fails to teach or suggest the feature in claim 3 as to the comparator. The Examiner relies on *Kleijne* to teach this feature. However, *Kleijne* also fails to teach or suggest the comparator. *Kleijne* is directed to a security device, such as a housing constructed to prevent external access to sensitive data stored therein. The Examiner asserts that *Kleijne* describes the comparator of claim 3 since *Kleijne* teaches a low temperature sensor 132 in the tamper detection circuitry 102 to protect the security device 10 against tampering at extremely low temperatures and a low voltage detector 130 that may be a voltage comparator which develops a low output when the voltage across resistor 152 falls below an internal reference potential of +1.15 volts. See *Kleijne*, at column 8, line 64 through column 9, line 8, and column 10, lines 19-23 and 29-45.

Applicants respectfully disagree with this reasoning since this assertion is not supported at all by the language in *Kleijne*. There are several problems with the Examiner's position. As an initial matter, it is well-established that the prior art references when considered alone or in combination, must teach each and every claimed feature exactly. One problem with the Examiner's rejection is that it is not supported by the very reference upon which the rejection relies. The low voltage detector 130 that may be a voltage comparator does not discontinue the low output in response to the voltage across resistor 152 rising above any internal reference potential by a preselected magnitude. At most, the voltage comparator can provide an output indicative of a unidirectional swing relative to the internal reference potential. Contrary to *Kleijne*, claim 3 recites a comparator adapted to deliver a second signal in response to a parameter of a first signal falling below a parameter of a reference signal, and to discontinue delivery of the second signal in response to the parameter of the first signal rising above the parameter of the reference signal by a preselected magnitude. Thus, neither *Seymour* nor *Kleijne* teach or suggest such a comparator. Furthermore, neither *Seymour* nor *Kleijne* provide any suggestion to modify or combine the prior art as suggested by the Examiner so as to arrive at Applicants' claimed invention.

Further, those skilled in the art would not combine *Seymour* and *Kleijne* to make obvious all of the elements of claim 3 of the present invention. *Seymour* is directed to sensing temperature of a physically moving mechanical part in an engine for the purposes of detecting a variation in an air flow to avoid explosion. In contrast, *Kleijne* is directed to a data security device for protecting stored sensitive data therein from external access. The Examiner uses improper hindsight reasoning to selectively cite portions of the disclosures of *Seymour* and *Kleijne* to render obvious all of the elements of claim 3. There is no indication of motivation in

the cited prior art to prompt those skilled in the art to combine their teaching to render obvious all of the elements of claim 3. Without applying improper hindsight reasoning, those skilled in the art would not combine *Seymour* and *Kleijne* to obviate all of the elements of claim 3 of the present invention. However, as described above, even if *Seymour* and *Kleijne* were combined, all of the elements of claim 3 would not be obtained. Moreover, all the claim limitations must be taught or suggested by the prior art. If an independent claim is nonobvious under 35 U.S.C. §103, then any claim depending therefrom is nonobvious. Therefore, the Examiner fails to establish a *prima facie* case of obviousness in light of the amendments and arguments provided herein. Therefore, Applicants respectfully assert that claims 3 and 14 are allowable.

As set forth below, the Examiner relies on various references to reject some of the independent and dependent claims. Claims 4 and 15 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over *Seymour* in view of the U.S. Patent No. 6,489,831 to Matranga et al. (*Matranga*). Claims 5, 6, 16, and 17 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over *Seymour* in view of the U.S. Patent No. 5,940,256 to Mackenzie et al. (*Mackenzie*). Claims 7 and 18 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over *Seymour* in view of the U.S. Patent No. 5,796,290 to Takahashi (*Takahashi*). Claims 8,9, 11, and 19 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over *Seymour* in view of the U.S. Patent No. 6,087,821 of Kojima (*Kojima*), and further in view of the U.S. Patent application 2003/0042014 to Jin (*Jin*). Claim 10 stands rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over *Seymour* in view of Kojima and Jin, and further in view of the U.S. Patent No. 6,825,736 to Kehler et al. (*Kehler*). Claim 21 stands rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over *Seymour* in view of the U.S. Patent No. 6,564,288 to Olarig et al. (*Olarig*). Applicants respectfully submit

that the rejected claims are not rendered obvious in view of the applied references. That is, *the cited references* fail to address the above-addressed shortcomings of *Seymour*.

Arguments with respect to dependent claims have been noted. However, in view of the aforementioned arguments, these arguments are moot and therefore not specifically addressed. To the extent that characterizations of the prior art references or Applicants' claimed subject matter are not specifically addressed, it is to be understood that Applicants do not acquiesce to such characterization. Reconsideration of the present application is respectfully requested.

For at least the aforementioned reasons, Applicants respectfully submit that the Examiner failed to make a *prima facie* case that the present invention is obvious over the prior art of record and request that the Examiner's rejections of claims 4-11, 15-19 and 21 under 35 U.S.C. §103(a) be withdrawn.

If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at the Houston, Texas telephone number (713) 934-4050 to discuss the steps necessary for placing the application in condition for allowance.

Respectfully submitted,

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